

# Review of a medical student–run surgery lecture series and skills lab curriculum

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## SUMMARY

Evidence suggests that early exposure to surgical techniques, surgical knowledge and mentors strongly correlates with students' interest, knowledge and confidence in general surgery as a postgraduate career choice. Preclerkship exposure to surgery and implementation of a formal surgical curriculum is often restricted owing to attending surgeon time commitments and cost limitations. To promote earlier exposure to surgery, a group of senior medical students at McMaster University, Hamilton, Ont., developed and implemented a novel pilot program with a surgical lecture series and a surgical skills laboratory for preclerkship students. This commentary discusses the effectiveness of these initiatives.

Canadian medical student interest in general surgery residency has declined over the past 15 years, most significantly between 1996 and 2001.<sup>1</sup> Several medical schools have since implemented initiatives to promote general surgery among medical students. Evidence suggests that early exposure to surgical techniques, surgical knowledge and mentors strongly correlates with students' interest, knowledge and confidence in general surgery as a postgraduate career choice.<sup>2</sup>

Clerkship experience that offers opportunities for surgical training and time in the operating room (OR) is crucial for attracting medical students to general surgery. In 2004, Ko and colleagues<sup>3</sup> suggested that shorter surgery clerkships may negatively affect interest in general surgery, especially given that these rotations are starting to include other surgical subspecialties. Results of a recent survey of clerks concluded that medical students were more satisfied with their OR experiences if they felt adequately prepared; most notably, they commented on the lack of a dedicated preclerkship surgical curriculum as a possible factor detrimental to the student learning experience.<sup>4</sup>

Previous work has suggested that the benefits of these initiatives are greater when applied before clerkship. However, preclerkship exposure to surgery and implementation of a formal surgical curriculum is often restricted owing to attending surgeon time commitments and cost limitations.<sup>5</sup> To promote earlier exposure to surgery, a group of senior medical students at McMaster University, Hamilton, Ont., developed and implemented a novel pilot program with a surgical lecture series and a surgical skills laboratory for preclerkship students. The effectiveness of these initiatives was explored to determine whether participation in such interventions improved medical students' opinions of their surgery rotation experience during clerkship. In addition to obtaining feedback on the program, we explored the feasibility of incorporating it into our formal curriculum.

## SURGERY LECTURE SERIES

In 2010, a group of senior medical students developed and implemented a series of 6 weekly didactic lectures for preclerkship medical students; the goal was to provide surgical knowledge and mentorship opportunities. Participants

were recruited through postings on an online medical student forum. Participation was voluntary. Each lecture consisted of a 1-hour presentation by senior medical students and was supervised by a staff surgeon. Lectures were followed by an informal question and answer session with the surgeon on various topics, such as career choice and lifestyle. Surgeon facilitators were chosen for the lecture series because they demonstrated an interest to teach in our program. Student lecturers were volunteers who had a particular career interest in general surgery. Topics were selected based on common general surgery pathologies.

### **SURGICAL SKILLS LABORATORY**

The surgical skills laboratory was a half-day session that was offered once during the program. Owing to overwhelming interest, we conducted a lottery for participant selection; we had to limit the session to 30 students owing to feasibility of conducting the laboratory. The skills laboratory consisted of 3 stations: 1) chest tube insertion, 2) Z-plasty and V-Y plasty and 3) vessel dissection and ligation. Synthetic and animal models were used for simulation. Two stations were set up per skill, and students rotated through different stations. Skills laboratory instructors were staff surgeons and surgical fellows. Each station consisted of 1 instructor and 5 students, with 15 minutes of instruction followed by 30 minutes of practice.

### **EVALUATION**

We designed a survey to evaluate our program as well as clerks' experiences during their surgery rotations. We distributed this survey to all clerks in the same cohort after their surgery rotations, regardless of whether they participated in our program. All clerks were asked a series of general opinion questions about their surgical rotation experiences. Those who completed the lecture series or skills laboratory (or both) were asked to continue on to answer some program-related questions, each on a 5-point Likert scale of agreement. There was also space for feedback (see the Appendix, Fig. S1, available at [canjsurg.ca](http://canjsurg.ca)). This approach facilitated comparison between clerks who participated in our program and those who did not. In order to adjust for selection bias, all respondents were instructed to indicate their level of interest in a surgical career on a 5-point Likert scale.

We distributed 56 surveys, and 50 were completed (89% response rate). Twenty-three respondents participated in at least 1 intervention (17 attended the lecture series, 13 attended the skills laboratory, 7 attended both), and 27 did not participate. Overall 76% of the program attendees indicated an interest in a surgical career. For analysis, we allocated respondents to 1 of 2 groups: those who did not participate (nonintervention) and those who participated in at least 1 of the program's offerings (intervention). Since

this was an exploratory pilot study with a small sample size and even smaller subgroups, we took great caution when interpreting our results, as we were underpowered in our sample size. In addition to descriptives, we performed *t* tests to observe any potential trends between 2 groups; while we report statistical significance, we do so to illustrate these trends as they may represent items that are deserving of focus when we implement our program on a much larger scale.

### **SURGICAL CLERKSHIP ROTATION EXPERIENCES**

We observed some trends between the nonintervention and intervention groups on several survey items (see the Appendix, Fig. S1). Response means were significantly higher (all  $p < 0.05$ ) in the intervention group for the following survey items: "I was comfortable enough with my surgical skills that I asked for additional technical opportunities"; "My team valued my contributions and clinical decision making"; and "I was able to actively participate in surgical teaching sessions." Clerks in both groups tended to disagree with the statement, "There is sufficient guidance with regards to technical skills in the preclerkship curriculum," (mean rating  $2.39 \pm 1.10$ ) and agree with the statement, "There should be more surgical content in the preclerkship curriculum," (mean rating  $3.96 \pm 1.05$ ).

### **PERCEPTIONS OF THE UTILITY OF INTERVENTIONS BY INTEREST IN A SURGICAL CAREER**

Although interest in a surgical career was greater in the intervention than the nonintervention group ( $p = 0.002$ ), there were no differences in ratings of the utility of interventions. All clerks in the intervention group rated both the surgery lecture series and the skills laboratory highly. Clerks' perceptions of quality of teaching when taught by senior medical students versus surgical residents or staff surgeons were compared using responses to the following statements: "I found that the lecture series taught by upper-year medical students was an effective way of learning key surgical concepts"; "I found the on-the-fly informal resident teachings (during clerkship) were an effective way of learning key surgical concepts"; and "I found the formal sessions taught by staff (during clerkship teachings) were an effective way of learning key surgical concepts." Mean scores for clerks' responses were  $4.17 \pm 0.8$  for senior medical students,  $4.06 \pm 1.1$  for surgical residents and  $4.18 \pm 0.8$  for staff surgeons.

Vertical analysis of the ratings of 3 types of teachers indicated no differences in how the respondents perceived teaching quality. Multiple qualitative comments were also voiced. For example, 1 clerk stated, "Lectures taught by the upper-year medical students created a friendlier environment and made me feel more comfortable asking questions." Another clerk noted, "The lecturers (senior medical

students) are good role models for us (so that) in the immediate future, you know where you should be (in terms of skills and knowledge) in a year.”

Meanwhile, clerks also commented, “Staff teachings offer more cutting-edge information,” and “Residents offer great practical teachings, but teachings vary due to the time constraints.”

## DISCUSSION

Overall, the student-run interventions were well received regardless of clerks’ interest in pursuing a surgical career. Our pilot study to evaluate our program suggests that this effect extends to the clerkship surgery rotation, as clerks who attended the interventions rated their surgery rotations more positively than clerks who did not attend. Many clerks felt that there was not enough focus on surgery in the preclerkship curriculum, thereby voicing a need for continued intervention.

Interestingly, the clerks found that the teaching provided by senior medical students during the lecture series was almost as effective as teaching sessions provided by surgical residents and staff during surgical clerkship. Qualitative studies are underway to elucidate more details with regards to the differences in teaching offered by instructors at varying levels of training.

While clerks’ opinions of the curriculum’s interventions are promising thus far, there is a need for further refinement. Through this pilot study, we were able to gather a variety of different feedback statements from participants, which we are currently using to guide us in our qualitative work.

Although we were limited by sample size to have adequate statistical power, the high response rate and roughly equal distribution of respondents who were and were not

interested in surgical careers limits selection bias, and thus this sample was felt to be representative of the student cohort.

## CONCLUSION

Programs like our surgery lecture series and surgical skills laboratory are an effective way to introduce surgery to pre-clerkship medical students and to promote student leadership and collaboration with surgical staff. The surgery lecture series has now been expanded to include other surgical specialties, while the skills laboratory has expanded to increase the number of skills and accommodate more students. In the early stages of this novel curriculum, these interventions have proven valuable for many participants. We are very enthusiastic that this student-initiated tradition will be adopted into the formal McMaster Medical School curriculum and continue to be of great benefit to medical students.

## References

1. Canadian Residency Matching Service. R-1 statistics. 1997-2010 [report]. Available: [www.carms.ca/eng/operations\\_R1stat\\_2.shtml](http://www.carms.ca/eng/operations_R1stat_2.shtml) (accessed 2012 Jan. 3).
2. Berman L, Rosenthal MS, Curry LA, et al. Attracting surgical clerks to surgical careers: role models, mentoring and engagement in the operating room. *J Am Coll Surg* 2008;207:793-800.
3. Ko CY, Escarce JJ, Baker L, et al. Predictors for medical students entering a general surgery residency: national survey results. *Surgery* 2004;136:567-72.
4. Chapman SJ, Hakeem AR, Marangoni G, et al. How can we enhance undergraduate medical training in the operating room? A survey of student attitudes and opinions. *J Surg Educ* 2013;70:326-33.
5. Naylor RA, Reisch JS, Valentine RJ. Do student perceptions of surgeons change during medical school? A longitudinal analysis during a 4-year curriculum. *J Am Coll Surg* 2010;210:527-32.

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